

**Tennessee Valley Authority
Integrated Resource Plan Stakeholder Review Group
Workshop on Energy Efficiency and Demand Response**

MEETING MINUTES

**December 10 & 11, 2009
Nashville, Tennessee**

Day One: December 10, 2009

Attendees:

Jack Simmons, Tennessee Valley Public Power Association (TVPPA)
George Kitchens, Joe Wheeler Electric Membership Corporation
Steve Adams, TVPPA
Sam Gomberg, Southern Alliance for Clean Energy (SACE)
John Wilson, SACE
Stephen Smith, SACE
Richard Holland, Tennessee Paper Council
Lance Brown, Alabama Partnership for Affordable Clean Energy
Tom King, Oak Ridge National Laboratory
Brian Paddock, Sierra Club
Louise Gorenflo, Sierra Club
Lloyd Webb, Tennessee Valley Industrial Committee
Hank List, Deputy Secretary, Commonwealth of Kentucky, Energy and Env Cabinet
David Reister
Deborah Woolley, Tennessee Chambers of Commerce
Bill Reeves, Tennessee Wildlife Resource Agency
Randy McAdams, Scott Madden
Omar Siddiqui, Electric Power Research Institute (guest)

Additional attendees: Randy Johnson, Joe Hoagland, Frank Rapley, Gary Brinkworth, Cass Larson, Mike Hynes, Mike Ingram, Ken Breeden, Ed Colston, Rebecca Tolene, Alisha Mulkey, Beth Keel, Bruce Rogers, Cindy Weiss, Chad McGhie, Susan Ross, Michelle Martin, BJ Gatten, Forest Forrester, James Linder, Steve Morrow, Cindy Herron, Bruce Schofield, Mary Jane Owens, O'Dell Frye, Trudi Pullin, Jason Davis (Scott Madden), and Steve Gilbert (Scott Madden)

I. Introduction and Workshop Objectives: The objective of the workshop was to have dialogue among stakeholders, so presentations were discussed from a briefing book rather than a standard presentation format. Some appendices have been added to the stakeholders' notebooks as backup information. The stakeholders' role is to provide discussion and viewpoints as a professional review group and to improve processes and validate the steps of the IRP process. Comments, action items, and questions will be documented.

II. Presentations (EE/DR Overview & Context): **All presentations can be found on the Stakeholder Review Sharepoint or on the external IRP website:**
http://www.tva.gov/environment/reports/irp/meeting_reports.htm

1. Meeting Load Growth with Energy Efficiency - Harvey Sachs, Senior Fellow; American Council for an Energy Efficient Economy (ACEEE) and Max Neubauer, Research Associate. Presented "Energy Efficiency in Tennessee: Overview of ACEEE Energy Efficiency Potential Assessments."
2. Energy Efficiency (EE) Best Practices - John Wilson, Southern Alliance for Clean Energy. Presented "Building the Energy Efficiency Resource for the TVA Region."
3. Demand-Side Management Potential in the Valley - Ed Colston, TVA, and Omar Siddiqui, EPRI. Presented recently issued report of EE/DR potential specific to the TVA Valley
 - TVA will identify a date when the EPRI study can be shared and will provide the study to the SRG
4. Open Discussion and Comments from the SRG:
 - A goal of the SRG should be to improve the performance of EE in each of the seven states within the next five years
 - Utilities need to understand what customers' needs are and their barriers to improvements
 - Many of TVA's customers cannot afford to pay for EE related improvements/programs.
 - There are political risks as well as financial risks
 - What happens in California doesn't necessarily apply to the Southeast
 - Industrial customers would be a good opportunity short term for EE/DR reductions
 - Energy efficiency should be seen as an energy resource instead of an activity
 - Consumers could benefit financially for reducing and avoiding new generation costs
 - One obstacle to communicating energy efficiency is the people in the Valley had the message that power was cheap
 - An additional challenge is that power distributors vary in size; the smallest TVPPA member has 900 retail consumers, the largest has 450,000
 - Education and time can change culture and mindset
 - Improved building codes and standards should be supported

LUNCH BREAK

III. Presentations (EE/DR Rate Structure)

1. TVA's Power Delivery Structure, Current, and Proposed Rates - Mike Hynes. The rates structure is designed as evolutionary, not revolutionary. Its impacts will be incremental and consistent with TVA's mission to provide low-cost, reliable electricity.
2. Open Discussion (Comments/Input from SRG members):
 - TVA has come a long way in end-use wholesale structure
 - The change from demand to energy has been a major cultural change for distributors.
 - While some distributors want to change their rate structure now, technology infrastructure (e.g., smart grid) is a barrier
 - Consideration of an inclining block rate to send a signal to consumers regarding excessive consumption.
 - An alternate rate design that might increase energy efficiency

-- SACE will provide data on rate structures that promote energy efficiency

IV. Presentations (EE/DR Strategy)

1. Energy Efficiency/Demand Response Strategy - Frank Rapley. The presentation is a history lesson to recap TVA's heritage on energy efficiency throughout the decade, recognizing that products have to work for the end user and for the power distributor, with the diversity to accommodate the varying distributor's sizes. Utilities have historically applied a command-and-control approach. However, EE/DR will require a more collaborative and customer facing approach to be successful.
2. Industrial Efficiency and Demand Response - Lloyd Webb, Tennessee Valley Industrial Committee. There is a challenge with energy efficiency and demand response in the industrial sector, but opportunities exist to develop programs that meet the customer's requirements. Keys that differentiate the industrial sector are that it's heterogeneous; has specialists who focus on energy; baseload energy suppliers; engaged in policy development and competition for investment.
3. Open Discussion (Comments/Input from SRG members):
 - TVA and distributors have a very diverse customer base.
 - It is important to establish financial incentives for stakeholders to pursue EE/DR
 - Industrial customers represent the best short-term opportunity for EE/DR programs
 - Combined Heat and Power (CHP) resources are undervalued and underutilized. The price point (i.e., utility avoided cost for power) must be high enough for industrial customers to invest in CHP; they don't want to risk "going long"
 - If building codes don't support efficiency, there is only so much that can be done
 - While the Southeast lags the rest of the country in EE/DR, the culture is not fundamentally opposed to it.
 - The Valley needs a consistent message that EE is a valued commodity. TVA can provide leadership in this area.

V. Presentations (EE/DR Financial Analysis)

1. Financial Analysis of Current EEDR Portfolio - Cass Larson. The initial financial analysis is used as a screening tool designed for improvement and also used to optimize TVA's portfolio.
2. Open Discussion (Comments/Input from SRG members):
 - The Total Resource Cost (TRC) test is indifferent to incentives. The incentive values are included, but net out of the calculation

Day Two: December 11, 2009

Attendees: Jack Simmons, George Kitchens, Steve Adams, Tom King, Bill Reeves, Sam Gomberg, John Wilson, Brian Paddock, Louise Gorenflo, Deborah Woodley, David Reister, Lance Brown, Hank List, Richard Holland, Lloyd Webb, Don Safer

TVA: Ed Colston, Frank Rapley, Mike Ingram, Gary Brinkworth, Randy Johnson, Joe Hoagland, Ken Breeden, Steve Morrow, Rebecca Tolene, Cindy Herron, Alisha Mulkey, Beth Keel, Betty Dyer, Cindy Weiss, Susan Ross, Michelle Martin, Chad McGhie, Forrest Forster, and James Linder

Scott Madden: Randy McAdams, Steve Gilbert, Jason Davis

I. Opening remarks - Randy McAdams, Scott Madden

II. Presentations (EE/DR Portfolio)

1. TVPPA Perspective: Energy Efficiency and Demand Reduction - Jack Simmons, TVPPA. Mr. Simmons reviewed the history and mission of TVPPA. Specifically, the association represents member interest to TVA, Congress, and public constituents; promotes common interests of its members; provides education/training opportunities for member employees; facilitates cooperation & information exchange with members and other organizations.; and coordinates activities with district power distributor associations and other state / regional public power organizations. In support of energy efficiency, a membership resolution was adopted May 2009. Power Distributors have an ongoing responsibility to promote the prudent and wise use of electricity; implemented programs must be real, attainable, and measurable; TVPPA & TVA should collectively design wholesale rate structures to encourage appropriate use of energy and capacity resources, while ensuring that reliability and cost-effective rates are maintained; TVPPA members support EE and encourage customer participation in energy efficiency programs collaboratively designed by TVPPA & TVA
2. Current Energy Efficiency/Demand Response Portfolio - Frank Rapley, TVA. TVA reviewed the recommended programs from PA consulting (previous meeting) for applicability to the TVA market and prioritized programs to be further customized to the demographic and climatic parameters of the Valley. Programs are designed to achieve short-term goal of 1400 MW reduction of summer peak demand by 2012. TVA's current energy efficiency/demand response programs are part of a continuously evolving portfolio - nothing has been screened out; we want to use everything that can be designed in a cost effective manner and come up with the best portfolio for the valley. TVA's current portfolio of energy efficiency/demand response programs are grouped into five key categories: residential; commercial and industrial; demand response; consumer-owned renewable generation; and consumer-owned clean generation. For future portfolio enhancement, TVA's long-term objective is to ensure sustainable energy efficiency/demand reduction programs by stimulating the marketplace. Current portfolio is an initial step in fulfilling this objective. Program development and improvement will be influenced by many factors. TVA will focus dollars on the best performing programs and capitalize on expanding infrastructure.

3. Open Discussion (Comments/Input from SRG members):

- An appropriate package needs to be put together to demonstrate reasons for distributor participation. TVA's role should be - this is going to happen, but collaborate with TVPPA.
- Few distributors report EE impacts. TVA should be the aggregate. Need to get clarity on who is doing what with transparency. If distributor is practicing EE, they need to get recognized; if TVA is practicing, they need to get recognized.
- There is no information available from TVA on EE; no clear data available. Need to have the proper reporting of EE with transparency.
- TVPPA should coordinate with distributors to align rates structure, if a distributor is not participating in EE, then TVA would have the right to cancel contract or say you will pay the higher price. In some cases, a distributor may be trying to do their best, but consumer is not willing; distributor cannot do much about non-participants.
- If a distributor has the technology and does not implement, they may get peer pressure from distributors who have implemented and are getting a lower rate.
- Decoupling goes back to demand and energy rate structure. The benefits need to be figured into rate structures. Do you structure the rate fairly to every customer, or structure to get optimal participation by customer? No way to do it simply, balancing gets complicated. How can you benefit those who accept and those who don't? Where is backlash going to come in?
- Are there baseline goals on EE? The message is to conserve to preserve; use energy wisely.
- The pricing structure needs to accomplish all issues - make sure distributors understand the reason and commitment.

LUNCH BREAK

III. Presentations (EE/DR Demand Modeling)

1. Modeling Introduction - Davis Reister, Environmental Stakeholder. The objective of the model is to simulate Annual Energy Demand. Since one form of energy can be substituted for another, the model will consider all forms of energy: solar thermal, solar electric passive solar, geothermal, wind, coal, natural gas, oil, nuclear, hydro, etc. Another model is required to stimulate minute-by-minute electricity demand. Energy is an intermediate good. Energy efficiency is providing the same energy service using less energy. Energy conservation is reducing consumption of energy service, e.g. turn lights off; raise temperature in summer and lower temperature in winter. There are three forms of energy demand models: econometric model; engineering process model; and engineering-economic models. Each were further defined and discussed for considering usages with data assumptions, technology options, price responsiveness and tradeoffs, and outputs.
2. Incorporation of EE/DR in Portfolio Optimization - Gary Brinkworth, TVA. TVA intends to use two methods to evaluate EE/DR in the IRP study: (1) load shapes (2) power purchase proxy. Both methods will use the "dependable capacity" of the DSM portfolio for modeling. EE and DR components of the DSM portfolio are represented as an hourly

load shape with an associated cost. This load shape is applied to the system load shape to produce a net load shape for capacity planning. Each EE/DR bundle in the portfolio is modeled as if it were an annual power purchase. EE/DR “blocks” can be scheduled or set as options to be selected by the capacity optimization model. A more robust version of the power purchase proxy method may be incorporated into the analysis of the short list of 20-year plans included in the draft IRP study report. Dependable capacity is the value in MW of the EE/DR portfolio at the time of the system peak. Bundles are comprised of programs that have passed the financial screen. Does not impact energy savings associated with the DSM portfolio - full energy value is used. Dependable capacity value will change if the portfolio design changes or the financial screen threshold is changed. All details of the computation of dependable capacity are not yet final.

3. Open discussion (Comments/Input from SRG members):

- Loading is important - which component comes first?
- Energy efficiency needs to be properly incorporated into all scenarios. It should not be limited to a single “throw-away” scenario
- TVA should consider looking for opportunities to increase its EE potential by reviewing successes of other utilities.
- TVA should leverage its role as a regulator to help drive energy efficiency. Customer collaboration is important, but not the only tool that should be used.

IV. Open Discussion (Comments/Input from SRG members):

- What is role of 7 States in EE/DR? What are the generating assets or anything that would prevent a distributor from being an EE company?
- Principle/agent barrier - impediments to do DR programs - ideas about challenging? Small business customers like model operated on the West Coast called Main Street. They send someone in for audit and install equipment at no cost. TVA is interested in piloting similar program, but need to determine the most cost efficient way to crack this market.
- Will just educating the consumer solve the problem? TVA working on this - if the group has any info, please provide to TVA. If using a rating system, homeowners may have extreme reaction to the program if they are required to make expensive improvements to sell or lease their property.
- Info from home inspections or loan for home allows lower payments on sale of home. The more informed the customers are, the likelier they are to use the program. TVA & TVPPA role should be to provide access to historical energy use data; home-buyers would like to request 1 year history of energy costs.
- How do you push legislation going forward? TVA cannot lobby for legislation; we can provide information, but groups in the SRG can lobby.
- Building codes are a state-by-state issue and all have different ideas/opinions. TVA has interest in what is being built now.
- A “smart” water heater will turn on and off and will be able to tell you where it is in the heating process. Oak Ridge lab has a heat pump water heater that is working well. Not

much going on with solar water heaters. Need to review total systems, gas, heat pump, electric to see what works and what can be done with hot water.

-- TVA has begun to assess the potential of water heaters and would be interested in additional information in this area.

-- Residential energy intensity - TN and AL are 1 & 2 on the list for residential energy use. Is there a reduction target?

-- Retro-fitting - DOE is pushing for weatherization. Campbell Creek project is a research center using three houses to show difference and dollars saved. Builders, realtors can understand the savings of EE. Overall cost of house with EE wasn't that much greater. Collecting data now, then will give data to TVA program design staff to see how they can design programs to utilize that data. Much of work will be training the builders to build EE homes. TVA will be a trainer to help community be more EE. Need to connect the dots and draw lines even though there are a lot of dots to connect (rates, messaging, industrial cost, etc). TVA and distributors inform public of good building technologies.

**** Next working meeting will be February 17, 2010 at 10:00 a.m. at TVA's West Tower Auditorium in Knoxville.**